The Geological and Geophysical Exploration of Venus

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With the successful completion of the Magellan mission, Venus has become one of the better studied planets in our solar system. The gravity field has been mapped globally with resolution approaching 400 km and the surface has been imaged and altimetry obtained for 98% of the planet. With the acquisition of this new knowledge, Venus has become a puzzle. Although its size and apparent composition suggest an Earth-like planet, Venus has evolved quite differently from Earth. Over the past 500 million years, Venus has apparently been geologically quiet, while the features of the Earth's surface have completely changed many times over, This paper reviews the current understanding of the geological evolution of Venus. Critical problems include the question of why Venus is so dominated by volcanism that appears to have occurred in great volume over a relatively short time span. What drives the tectonism that formed the mountains that ring Lakshmi Planum? As might be expected, we have many more questions now that we have more data.

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